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<110> MOECKEL, Bettina

	BATHE, Brigitte	
	HERMANN, Thomas	
	PFEFFERLE, Walter	
	BINDER, Michael	
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-6-

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Tie Asn Arg Lys Leu Gly Leu Gly Gly Asp His Asp Gly Leu Met Thr 305 310 320

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Leu Thr Glu Glu Asp Ile Ala Thr Thr Ile Glu Tyr Leu Val Arg Leu  $325 \hspace{1cm} 330 \hspace{1cm} 335$ 

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Val Ser Ala Asp Phe Ile Thr Ile Met Ala Asp Asp Gly Lys Arg Glu 645 650 655

Thr Tyr Leu Leu Arg Lys Phe Gln Arg Thr Asn Gln Gly Thr Ser Tyr  $\bigcirc$  660 665 670

Hen Gln Lys Pro Leu Val Asn Leu Gly Glu Arg Val Glu Ala Gly Gln √ 675 680 685

Val Ile Ala Asp Gly Pro Gly Thr Phe Asn Gly Glu Met Ser Leu Gly

↓ 690 695 700

Try Asn Leu Leu Val Ala Phe Met Pro Trp Glu Gly His Asn Tyr Glu 905 710 720 U

p Ala Ile Ile Leu Asn Gln Asn Ile Val Glu Gln Asp Ile Leu Thr 44 725 730 735

Ser Ile His Ile Glu Glu His Glu Ile Asp Ala Arg Asp Thr Lys Leu  $740 \hspace{1.5cm} 745 \hspace{1.5cm} 760 \hspace{1.5cm}$ 

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- Ser Ala Gly Trp Ser Val Asp Pro Glu Asp Pro Glu Asn Ala Glu Leu 930 935 940
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943	ŗд	gta Val	acc Thr	agc Ser	ggc Gly	ctt Leu 75	gag Glu	aac Asn	att Ile	ctc Leu	gag Glu 80	gag Glu	ctc Leu	tcc Ser	cca Pro	atc Ile 85	956
16 G C	ln	gat Asp	tac Tyr	tct Ser	gga Gly 90	aac Asn	atg Met	tcc Ser	ctg Leu	agc Ser 95	ctt Leu	tcg Ser	gag Glu	cca Pro	cgc Arg 100	ttc Phe	1004
0 C	Lu	gac Asp	gtc Val	aag Lys 105	aac Asn	acc Thr	att Ile	gac Asp	gag Glu 110	gcg Ala	aaa Lys	gaa Glu	aag Lys	gac Asp 115	atc Ile	aac Asn	1052
Т	yr	Ala	Ala 120	Pro	Leu	tat Tyr	Val	Thr 125	Ala	Glu	Phe	Val	Asn 130	Asn	Thr	Thr	1100
G	тУ	135	11e	rys	Ser	cag Gln	Thr 140	Val	Phe	Ile	Gly	Asp 145	Phe	Pro	Met	Met	1148
T	cg hr 50	gac Asp	aag Lys	gga Gly	acg Thr	ttc Phe 155	atc Ile	atc Ile	aac Asn	gga Gly	acc Thr 160	gaa Glu	cgc Arg	gtt Val	gtg Val	gtc Val 165	1196
a S	gc er	cag Gln	ctc Leu	gtc Val	ege Arg 170	tcc Ser	ccg Pro	ggc Gly	gtg Val	tac Tyr 175	ttt Phe	gac Asp	cag Gln	acc Thr	atc Ile 180	gat Asp	1244
a L	ag ys	tca Ser	act Thr	gag Glu 185	cgt Arg	cca Pro	ctg Leu	cac His	gcc Ala 190	gtg Val	aag Lys	gtt Val	att Ile	cct Pro 195	ttc Phe	cgt Arg	1292

ggt gct tgg ctt gag ttt gac gtc gat aag cgc gat tcg gtt ggt gtt 1340

G1y	Ala	Trp 200	Leu	Glu	Phe	Asp	Val 205	Asp	Lys	Arg	Asp	Ser 210	Val	Gly	Val	
cgt Arg	att Ile 215	gac Asp	cgc Arg	aag Lys	cgt Arg	cgc Arg 220	cag Gln	cca Pro	gtc Val	acc Thr	gta Val 225	ctg Leu	ctg Leu	aag Lys	gct Ala	1388
ctt Leu 230	ggc Gly	tgg Trp	acc Thr	act Thr	gag Glu 235	cag Gln	atc Ile	acc Thr	gag Glu	cgt Arg 240	ttc Phe	ggt Gly	ttc Phe	tct Ser	gaa Glu 245	1436
atc Ile	atg Met	atg Met	tcc Ser	acc Thr 250	ctc Leu	gag Glu	tcc Ser	gat Asp	ggt Gly 255	gta Val	gca Ala	aac Asn	acc Thr	gat Asp 260	gag Glu	1484
gca Ala	ttg Leu	ctg Leu	gag Glu 265	atc Ile	tac Tyr	cgc Arg	aag Lys	cag Gln 270	cgt Arg	cca Pro	ggc Gly	gag Glu	cag Gln 275	cct Pro	acc Thr	1532
cgc Arg	gac Asp	ctt Leu 280	gcg Ala	cag Gln	tcc Ser	ctc Leu	ctg Leu 285	gac Asp	aac Asn	agc Ser	ttc Phe	ttc Phe 290	cgt Arg	gca Ala	aag Lys	1580
egc Arg	tac Tyr 295	gac Asp	ctg Leu	gct Ala	ege Arg	gtt Val 300	ggt Gly	cgt Arg	tac Tyr	aag Lys	atc Ile 305	aac Asn	cgc Arg	aag Lys	ctc Leu	1628
ggc Gly 310	ctt Leu	ggt Gly	ggc Gly	gac Asp	cac His 315	gat Asp	ggt Gly	ttg Leu	atg Met	act Thr 320	ctt Leu	act Thr	gaa Glu	gag Glu	gac Asp 325	1676
Atc Tle	gca Ala	acc Thr	acc Thr	atc Ile 330	gag Glu	tac Tyr	ctg Leu	gtg Val	cgt Arg 335	ctg Leu	cac His	gca Ala	ggt Gly	gag Glu 340	cgc Arg	1724
∰tc Val	atg Met	act Thr	tct Ser 345	cca Pro	aat Asn	ggt Gly	gaa Glu	gag Glu 350	atc Ile	cca Pro	gtc Val	gag Glu	acc Thr 355	gat Asp	gac Asp	1772
atc Tle	gac Asp	cac His 360	ttt Phe	ggt Gly	aac Asn	cgt Arg	cgt Arg 365	ctg Leu	egt Arg	acc Thr	gtt Val	ggc Gly 370	gaa Glu	ctg Leu	atc Ile	1820
cag Gln	aac Asn 375	cag Gln	gtc Val	cgt Arg	gtc Val	ggc Gly 380	ctg Leu	tcc Ser	cgc Arg	atg Met	gag Glu 385	cgc Arg	gtt Val	gtt Val	cgt Arg	1868
gag Glu 390	cgt Arg	atg Met	acc Thr	acc Thr	cag Gln 395	gat Asp	gcg Ala	gag Glu	tcc Ser	att Ile 400	act Thr	cct Pro	act Thr	tcc Ser	ttg Leu 405	1916
atc Ile	aac Asn	gtt Val	cgt Arg	cct Pro 410	gtc Val	tct Ser	gca Ala	gct Ala	atc Ile 415	cgt Arg	gag Glu	ttc Phe	ttc Phe	gga Gly 420	act Thr	1964
tcc Ser	cag Gln	ctg Leu	tct Ser 425	cag Gln	ttc Phe	atg Met	gtc Val	cag Gln 430	aac Asn	aac Asn	tcc Ser	ctg Leu	tct Ser 435	ggt Gly	ttg Leu	2012
act Thr	cac His	aag Lys 440	cgt Arg	cgt Arg	ctg Leu	tcg Ser	gct Ala 445	ctg Leu	ggc Gly	ccg Pro	ggt Gly	ggt Gly 450	ctg Leu	tcc Ser	cgt Arg	2060

								gac Asp								2108
cgt Arg 470	atg Met	tgc Cys	cca Pro	att Ile	gag Glu 475	act Thr	ccg Pro	gaa Glu	ggt Gly	cca Pro 480	aac Asn	att Ile	ggc Gly	ctg Leu	atc Ile 485	2156
ggt Gly	tcc Ser	ttg Leu	gct Ala	tcc Ser 490	tat Tyr	gct Ala	cga Arg	gtg Val	aac Asn 495	cca Pro	ttc Phe	ggt Gly	ttc Phe	att Ile 500	gag Glu	2204
acc Thr	cca Pro	tac Tyr	cgt Arg 505	cgc Arg	atc Ile	atc Ile	gac Asp	ggc Gly 510	aag Lys	ctg Leu	acc Thr	gac Asp	cag Gln 515	att Ile	gac Asp	2252
								cgc Arg								2300
acg Thr	cac His 535	tac Tyr	gac Asp	gaa Glu	gag Glu	ggc Gly 540	aac Asn	atc Ile	acc Thr	gat Asp	gag Glu 545	acc Thr	gtc Val	act Thr	gtt Val	2348
egt Arg \$50	ctg Leu	aag Lys	gac Asp	ggc Gly	gac Asp 555	atc Ile	gcc Ala	atg Met	gtt Val	ggc Gly 560	cgc Arg	aac Asn	gcg Ala	gtt Val	gat Asp 565	2396
tac Eyr U	Met	Asp	Val	Ser 570	Pro	Arg	Gln	Met	Val 575	Ser	Val	Gly	Thr	Ala 580	Met	2444
Takt Tle	cca Pro	ttc Phe	ctg Leu 585	gag Glu	cac His	gac Asp	gat Asp	gct Ala 590	aac Asn	cgt Arg	gca Ala	ctg Leu	atg Met 595	ggc Gly	gcg Ala	2492
aac	atg Met	cag Gln 600	aag Lys	cag Gln	gct Ala	gtg Val	cca Pro 605	ctg Leu	att Ile	cgt Arg	gcc Ala	gag Glu 610	gct Ala	cct Pro	ttc Phe	2540
∰tg Val	ggc Gly 615	acc Thr	ggt Gly	atg Met	gag Glu	cag Gln 620	cgc Arg	gca Ala	gca Ala	tac Tyr	gac Asp 625	gcc Ala	gge Gly	gac Asp	ctg Leu	2588
gtt Val 630	att Ile	acc Thr	cca Pro	gtc Val	gca Ala 635	ggt Gly	gtg Val	gtg Val	gaa Glu	aac Asn 640	gtt Val	tca Ser	gct Ala	gac Asp	ttc Phe 645	2636
atc Ile	acc Thr	atc Ile	atg Met	gct Ala 650	gat Asp	gac Asp	ggc Gly	aag Lys	cgc Arg 655	gaa Glu	acc Thr	tac Tyr	ctg Leu	ctg Leu 660	cgt Arg	2684
aag Lys	ttc Phe	cag Gln	cgc Arg 665	acc Thr	aac Asn	cag Gln	ggc Gly	acc Thr 670	agc Ser	tac Tyr	aac Asn	cag Gln	aag Lys 675	cct Pro	ttg Leu	2732
Val	Asn	Leu 680	Gly	Glu	Arg	Val	Glu 685	gct Ala	Gly	Gln	Val	Ile 690	Ala	Asp	Gly	2780
cca Pro	ggt Gly	acc Thr	ttc Phe	aat Asn	ggt Gly	gaa Glu	atg Met	tcc Ser	ctt Leu	ggc Gly	cgt Arg	aac Asn	ctt Leu	ctg Leu	gtt Val	2828

695	700	705

gc Al 71	g ttc a Phe	atg Met	cct Pro	tgg Trp	gaa Glu 715	ggc	cac	aac Asn	tac Tyr	gag Glu 720	gat Asp	gcg Ala	atc Ile	atc Ile	ctc Leu 725	2876
aa As	c cag n Gln	aac Asn	atc Ile	gtt Val 730	Glu	cag Gln	gac Asp	atc Ile	ttg Leu 735	acc Thr	tcg Ser	atc Ile	cac His	atc Ile 740	gag Glu	2924
ga Gl	g cac u His	gag Glu	atc Ile 745	gat Asp	gcc Ala	cgc Arg	gac Asp	act Thr 750	aag Lys	ctt Leu	ggc Gly	gcc Ala	gaa Glu 755	gaa Glu	atc Ile	2972
ac Th	c cgc Arg	gac Asp 760	atc Ile	cct Pro	aat Asn	gtg Val	tct Ser 765	gaa Glu	gaa Glu	gtc Val	ctc Leu	aag Lys 770	gac Asp	ctc Leu	gac Asp	3020
ga: Asj	e ege Arg 775	ggt Gly	att Ile	gtc Val	cgc Arg	atc Ile 780	ggt Gly	gct Ala	gat Asp	gtt Val	cgt Arg 785	gac Asp	ggc Gly	gac Asp	atc Ile	3068
Lev Lev	g gtc 1 Val )	ggt Gly	aag Lys	gtc Val	acc Thr 795	cct Pro	aag Lys	ggc Gly	gag Glu	acc Thr 800	gag Glu	ctc Leu	acc Thr	ccg Pro	gaa Glu 805	3116
/i	g ege 1 Arg	Leu	Leu	Arg 810	Ala	Ile	Phe	Gly	Glu 815	Lys	Ala	Arg	Glu	Val 820	Arg	3164
gat Asp	acc Thr	tcc Ser	atg Met 825	aag Lys	gtg Val	cct Pro	cac His	ggt Gly 830	gag Glu	acc Thr	ggc Gly	aag Lys	gtc Val 835	atc Ile	ggc Gly	3212
Me.	cgt Arg	His 840	Phe	Ser	Arg	Glu	Asp 845	Asp	Asp	Asp	Leu	Ala 850	Pro	Gly	Val	3260
Ası	gag Glu 855	atg Met	atc Ile	cgt Arg	atc Ile	tac Tyr 860	gtt Val	gct Ala	cag Gln	aag Lys	cgt Arg 865	aag Lys	atc Ile	cag Gln	gac Asp	3308
gg 9 Gl 5 870	gat Asp	aag Lys	ctc Leu	gct Ala	ggc Gly 875	cgc Arg	cac His	ggt Gly	aac Asn	aag Lys 880	ggt Gly	gtt Val	gtc Val	ggt Gly	aaa Lys 885	3356
att Ile	ttg Leu	cct Pro	cag Gln	gaa Glu 890	gat Asp	atg Met	cca Pro	ttc Phe	ctt Leu 895	cca Pro	gac Asp	ggc Gly	act Thr	cct Pro 900	gtt Val	3404
gad	atc Ile	atc Ile	ttg Leu 905	aac Asn	acc Thr	cac His	ggt Gly	gtt Val 910	cca Pro	cgt Arg	cgt Arg	atg Met	aac Asn 915	att Ile	ggt Gly	3452
caç Glr	gtt Val	ctt Leu 920	gag Glu	acc Thr	cac His	ctt Leu	ggc Gly 925	tgg Trp	ctg Leu	gca Ala	tct Ser	gct Ala 930	ggt Gly	tgg Trp	tcc Ser	3500
gt g Val	gat Asp 935	cct Pro	gaa Glu	gat Asp	cct Pro	gag Glu 940	aac Asn	gct Ala	gag Glu	ctc Leu	gtc Val 945	aag Lys	act Thr	ctg Leu	cct Pro	3548

											u Ti		ca act la Thi			3596
										Gĺ			tc gct eu Ala		n Ser	3644
cgt Arg	cca Pro	aac Asn	cgc Arg 985	gac Asp	ggc Gly	gac Asp	Val I	atg Met 990	gtt Val	aa As	n A	cg g la A	at gg sp Gl:	y Lys	a gca s Ala	3692
acg Thr	ctt Leu	atc Ile 1000	Asp	ggt Gly	cgc Arg	tcc Ser	ggt Gly 100	G1					tac Tyr 1010	ccg Pro		3737
tcc Ser	atc Ile	ggc Gly 1015	Tyr	atg Met	tac Tyr	atg Met	ctg Leu 1020	Ly	g c	tg eu	cac His	cac His	ctc Leu 1025	gtt Val	gac Asp	3782
gag Glu	aag Lys	atc Ile 1030	His	gca Ala	cgt Arg	tcc Ser	act Thr 1035	G1	t c y P	ct	tac Tyr	tcc Ser	atg Met 1040	att Ile		3827
Gln 00	Gln	Pro 1045	Leu	Gly	Gly	Lys	Ala 1050	Gl	n P	he	Gly	Gly	cag Gln 1055	Arg	Phe	3872
Gly Ul	Glu	Met 1060	Glu	Va1	Trp	Ala	Met 1065	Gl 5	n A	la	Tyr	Gly	1070	gcc Ala		3917
Thr	Leu	Gln 1075	Glu	Leu	Leu	Thr	1080	Ly	s S	er	Asp	Asp	Val 1085	gtt Val		3962
un Co	Val	1090	vaı	TYE	GIU	АІа	1095	va 5	IL	ys	GIY	GIu	1100	atc Ile		4007
Asp	Pro	Gly 1105	Ile	Pro	Glu	Ser	1110	Ly	s V	al	Leu	Leu	Lys 1115			4052
Gln	Ser	Leu 1120	Cys	Leu	Asn	Val	Glu 1125	Va	l L	eu	Ser	Ala	gac Asp 1130	Gly	Thr	4097
Pro	Met	Glu 1135	Leu	Ala	Gly	Asp	Asp 1140	As:	рĀ	sp	Phe	Āsp	cag Gln 1145	Ala	Ğİy	4142
Ala	Ser	Leu 1150	Gly	Ile	Asn	Leu	Ser 1155	Ar	g A	qa	Glu	Arg	tcc Ser 1160	Asp	gcc Ala	4187
gac Asp			tag	caga	tca	gaaa	acaac	ec g	cta	gaa	atc	aag	ccata	ca		4236

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210> 4
2211> 1165
2212> PRT
2213> Corynebacterium glutamicum
2300> 4
24
Val Leu Glu Gly Leu Ile Leu Ala Val Ser Arg Gln Thr Lys Ser Val

Val Asp Ile Pro Gly Ala Pro Gln Arg Tyr Ser Phe Ala Lys Val Ser

Ala Pro Ile Glu Val Pro Gly Leu Leu Asp Leu Gln Leu Asp Ser Tyr 35 40 45

Ser Trp Leu Ile Gly Thr Pro Glu Trp Arg Ala Arg Gln Lys Glu Glu 50 55 60

Phe Gly Glu Gly Ala Arg Val Thr Ser Gly Leu Glu Asn Ile Leu Glu 65  $\phantom{000}70\phantom{000}$  75  $\phantom{0000}80\phantom{000}$ 

Glu Leu Ser Pro Ile Gln Asp Tyr Ser Gly Asn Met Ser Leu Ser Leu

85 90 95

Ser Glu Pro Arg Phe Glu Asp Val Lys Asn Thr Ile Asp Glu Ala Lys  $100 \hspace{1.5cm} 105 \hspace{1.5cm} 110$ 

Glu Lys Asp Ile Asn Tyr Ala Ala Pro Leu Tyr Val Thr Ala Glu Phe

Val Asn Asn Thr Thr Gly Glu Ile Lys Ser Gln Thr Val Phe Ile Gly 130 135 140

Asp Phe Pro Met Met Thr Asp Lys Gly Thr Phe Ile Ile Asn Gly Thr 145 150 155

Glu Arg Val Val Val Ser Gln Leu Val Arg Ser Pro Gly Val Tyr Phe 165 170 175

Asp Gln Thr Ile Asp Lys Ser Thr Glu Arg Pro Leu His Ala Val Lys

脚 Ile Pro Phe Arg Gly Ala Trp Leu Glu Phe Asp Val Asp Lys Arg 」 195 200 205

The Leu Leu Lys Ala Leu Gly Trp Thr Thr Glu Gln Ile Thr Glu Arg 225 230 235 240

The Gly Phe Ser Glu Ile Met Met Ser Thr Leu Glu Ser Asp Gly Val

Ala Asn Thr Asp Glu Ala Leu Leu Glu Ile Tyr Arg Lys Gln Arg Pro  $260 \hspace{1cm} 265 \hspace{1cm} 270 \hspace{1cm}$ 

Gly Glu Gln Pro Thr Arg Asp Leu Ala Gln Ser Leu Leu Asp Asn Ser 275 280 285

Phe Phe Arg Ala Lys Arg Tyr Asp Leu Ala Arg Val Gly Arg Tyr Lys 290 295 300

Ile Asn Arg Lys Leu Gly Leu Gly Gly Asp His Asp Gly Leu Met Thr 305 310 315

Leu Thr Glu Glu Asp Ile Ala Thr Thr Ile Glu Tyr Leu Val Arg Leu 325 330 335

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His	Ala	Gly	Glu 340	Arg	Val	Met	Thr	Ser 345	Pro	Asn	Gly	Glu	Glu 350	Ile	Pro
Val	Glu	Thr 355	Asp	Asp	Ile	Asp	His 360	Phe	Gly	Asn	Arg	Arg 365	Leu	Arg	Thr
Val	Gly 370	Glu	Leu	Ile	Gln	Asn 375	Gln	Val	Arg	Val	Gly 380	Leu	Ser	Arg	Met
Glu 385	Arg	Val	Val	Arg	Glu 390	Arg	Met	Thr	Thr	Gln 395	Asp	Ala	G1u	Ser	Ile 400
Thr	Pro	Thr	Ser	Leu 405	Ile	Asn	Val	Arg	Pro 410	Val	Ser	Ala	Ala	Ile 415	Arg
Glu	Phe	Phe	Gly 420	Thr	Ser	Gln	Leu	Ser 425	Gln	Phe	Met	Val	Gln 430	Asn	Asn
Ger M	Leu	Ser 435	Gly	Leu	Thr	His	Lys 440	Arg	Arg	Leu	Ser	Ala 445	Leu	Gly	Pro
Sily O Ul	450					455				Glu	460				
465	Ser	His	Tyr	Gly	Arg 470	Met	Cys	Pro	Ile	Glu 475	Thr	Pro	Glu	Gly	Pro 480
	Ile	Gly	Leu	Ile 485	Gly	Ser	Leu	Ala	Ser 490	Tyr	Ala	Arg	Val	Asn 495	Pro
Phe	Gly	Phe	Ile 500	Glu	Thr	Pro	Tyr	Arg 505	Arg	Ile	Ile	Asp	Gly 510	Lys	Leu
Thr	Asp	Gln 515	Ile	Asp	Tyr	Leu	Thr 520	Ala	Asp	Glu	Glu	Asp 525		Phe	Val
Val	Ala 530	Gln	Ala	Asn	Thr	His 535	Tyr	Asp	Glu	Glu	Gly 540		Ile	Thr	Asp

Arg Asn Ala Val Asp Tyr Met Asp Val Ser Pro Arg Gln Met Val Ser 565 570 575

Val Gly Thr Ala Met Ile Pro Phe Leu Glu His Asp Asp Ala Asn Arg  $580 \hspace{1.5cm} 585 \hspace{1.5cm} 590$ 

Ala Leu Met Gly Ala Asn Met Gln Lys Gln Ala Val Pro Leu Ile Arg 600

Ala Glu Ala Pro Phe Val Gly Thr Gly Met Glu Gln Arg Ala Ala Tyr 610

Asp Ala Gly Asp Leu Val Ile Thr Pro Val Ala Gly Val Val Glu Asn 625

Val Ser Ala Asp Phe Ile Thr Ile Met Ala Asp Asp Gly Lys Arg Glu 655

Thr Tyr Leu Leu Arg Lys Phe Gln Arg Thr Asn Gln Gly Thr Ser Tyr 660

Asn Gin Lys Pro Leu Val Asn Leu Gly Glu Arg Val Glu Ala Gly Gln
675
680
685

Wal Ile Ala Asp Gly Pro Gly Thr Phe Asn Gly Glu Met Ser Leu Gly

695

700

Arg Asn Leu Leu Val Ala Phe Met Pro Trp Glu Gly His Asn Tyr Glu 715 710 720

%Asp Ala Ile Ile Leu Asn Gln Asn Ile Val Glu Gln Asp Ile Leu Thr 법 725 735 합

Wer lie His Ile Glu Glu His Glu Ile Asp Ala Arg Asp Thr Lys Leu 745 750

755 760 765

Leu Lys Asp Leu Asp Asp Arg Gly Ile Val Arg Ile Gly Ala Asp Val 770 775

Arg Asp Gly Asp Ile Leu Val Gly Lys Val Thr Pro Lys Gly Glu Thr 785 790 795

Ala Arg Glu Val Arg Asp Thr Ser Met Lys Val Pro His Gly Glu Thr  $820 \ \ \,$  825  $\ \ \,$  830

Gly Lys Val Ile Gly Val Arg His Phe Ser Arg Glu Asp Asp Asp Asp

835 840 845

Leu Ala Pro Gly Val Asn Glu Met Ile Arg Ile Tyr Val Ala Gln Lys 850 855 860

Arg Lys Ile Gln Asp Gly Asp Lys Leu Ala Gly Arg His Gly Asn Lys 865 870 880

Gly Val Val Gly Lys Ile Leu Pro Gln Glu Asp Met Pro Phe Leu Pro 885  $\,$  890  $\,$  895

Asp Gly Thr Pro Val Asp Ile Ile Leu Asn Thr His Gly Val Pro Arg  $900 \hspace{1.5cm} 905 \hspace{1.5cm} 910$ 

Arg Met Asn Ile Gly Gln Val Leu Glu Thr His Leu Gly Trp Leu Ala 915 920 925

Ser Ala Gly Trp Ser Val Asp Pro Glu Asp Pro Glu Asn Ala Glu Leu g 930 940 g

Val Lys Thr Leu Pro Ala Asp Leu Leu Glu Val Pro Ala Gly Ser Leu 955 956 950 Ul

thr Ala Thr Pro Val Phe Asp Gly Ala Ser Asn Glu Glu Leu Ala Gly 965 970 975 급

Bu Leu Ala Asn Ser Arg Pro Asn Arg Asp Gly Asp Val Met Val Asn H 980 985 990

Ala Asp Gly Lys Ala Thr Leu Ile Asp Gly Arg Ser Gly Glu Pro Tyr 995 1000 1005

Pro Tyr Pro Val Ser Ile Gly Tyr Met Tyr Met Leu Lys Leu His 1010 1015 1020

His Leu Val Asp Glu Lys Ile His Ala Arg Ser Thr Gly Pro Tyr 1025 1030 1035

Ser Met  $\,$  Ile Thr Gln Gln Pro  $\,$  Leu Gly Gly Lys Ala  $\,$  Gln Phe Gly 1040  $\,$  1050  $\,$ 

Gly Gln Arg Phe Gly Glu Met Glu Val Trp Ala Met Gln Ala Tyr 1055 1060 1065

Asp Val Val Gly Arg Val Lys Val Tyr Glu Ala Ile Val Lys Gly 1090 Glu Asn Ile Pro Asp Pro Gly Ile Pro Glu Ser Phe Lys Val Leu 1100 Leu Lys Glu Leu Gln Ser Leu Cys Leu Asn Val Glu Val Leu Ser 1115 1120 Ala Asp Gly Thr Pro Met Glu Leu Ala Gly Asp Asp Asp Phe 1130 Asp Gln Ala Gly Ala Ser Leu Gly Ile Asn Leu Ser Arg Asp Glu Arg Ser Asp Ala Asp Thr Ala 1160 **\$210>** ∰ ≼211> 5099 <212> DNA Corynebacterium glutamicum ₩213> 220> R221> CDS **<222>** (702)..(4196) 10 <400> 5 acaatgtgac togtgatttt tgggtggatc agcgtaccgg tttggttgtc gatctagctg 60 aaaatattga tgatttttac ggcgaccgca gcggccagaa gtacgaacag aaattgcttt 120 180 togacgecte cetegacgat geagetgtet ctaagetggt tgeacaggee gaaageatee ctgatggaga tgtgagcaaa atcgcaaata ccgtaggtat tgtgatcggt gcggtattgg 240 ctctcgtggg cctggccggg tgttttgggg cgtttgggaa gaaacgtcga gaagcttaac 300 360 ctqctqttca aataqatttt ccctqtttcg aattgcggaa accccgggtt tgtttgctag ggtgcctcgt agaaggggtc aagaagattt ctgggaaacg cgcccgtgcg gttggttgct 420 aatagcacge ggagcaccag atgaaaaatc teceetttae tttegegege gattqqtata 480 540 ctctgagtcg ttgcgttgga attcgtgact ctttttcgtt cctgtagcgc caagaccttg 600 atcaaggtgg tttaaaaaaa ccgatttgac aaggtcattc agtgctatct ggagtcgttc

agggg	ggat	cg g	gtto	ectea	ıg ca	gaco	aatt	gct	caaa	aat	acca	igcgg	tg t	tgat	ctgca	660
cttaa	atgg	cc t	tgad	cago	ec aç	gtgo	aatt	acc	egeg	ıtga					a ccc y Pro 5	716
atc t Ile I	ttg Leu	gca Ala	gtc Val	tcc Ser 10	cgc Arg	cag Gln	acc Thr	aag Lys	tca Ser 15	gtc Val	gtc Val	gat Asp	att Ile	ccc Pro 20	ggt Gly	764
gca d Ala 1																812
ccc (																860
acg of Thr I																908
cgc (	Val	Thr	Ser	Gly	Leu 75	Glu	Asn	Ile	Leu	Glu 80	Glu	Leu	Ser	Pro	11e 85	956
Eag of the second	gat Asp	tac Tyr	tct Ser	gga Gly 90	aac Asn	atg Met	tcc Ser	ctg Leu	agc Ser 95	ctt Leu	tcg Ser	gag Glu	cca Pro	cgc Arg 100	ttc Phe	1004
gaa q Glu l																1052
the of Tyr i																1100
ggt g	gaa Glu 135	atc Ile	aag Lys	tct Ser	cag Gln	act Thr 140	gtc Val	ttc Phe	atc Ile	ggc Gly	gat Asp 145	ttc Phe	cca Pro	atg Met	atg Met	1148
acg of Thr 1 150																1196
agc ( Ser (																1244
aag : Lys :	tca Ser	act Thr	gag Glu 185	cgt Arg	cca Pro	ctg Leu	cac His	gcc Ala 190	gtg Val	aag Lys	gtt Val	att Ile	cct Pro 195	tcc Ser	egt Arg	1292
ggt ( Gly )	gct Ala	tgg Trp 200	ctt Leu	gag Glu	ttt Phe	gac Asp	gtc Val 205	gat Asp	aag Lys	cgc Arg	gat Asp	tcg Ser 210	gtt Val	ggt Gly	gtt Val	1340
Arg																1388

ctt Leu 230	ggc Gly	tgg Trp	acc Thr	act Thr	gag Glu 235	cag Gln	atc Ile	acc Thr	gag Glu	cgt Arg 240	ttc Phe	ggt Gly	ttc Phe	tct Ser	gaa Glu 245	1436
				acc Thr 250												1484
gca Ala	ttg Leu	ctg Leu	gag Glu 265	atc Ile	tac Tyr	cgc Arg	aag Lys	cag Gln 270	cgt Arg	cca Pro	ggc Gly	gag Glu	cag Gln 275	cct Pro	acc Thr	1532
cgc Arg	gac Asp	ctt Leu 280	gcg Ala	cag Gln	tcc Ser	ctc Leu	ctg Leu 285	gac Asp	aac Asn	agc Ser	ttc Phe	ttc Phe 290	cgt Arg	gca Ala	aag Lys	1580
				gct Ala												1628
ggc Gly 310	ctt Leu	ggt Gly	ggc Gly	gac Asp	cac His 315	gat Asp	ggt Gly	ttg Leu	atg Met	act Thr 320	ctt Leu	act Thr	gaa Glu	gag Glu	gac Asp 325	1676
e tc tle	gca Ala	acc Thr	acc Thr	atc Ile 330	gag Glu	tac Tyr	ctg Leu	gtg Val	cgt Arg 335	ctg Leu	cac His	gca Ala	ggt Gly	gag Glu 340	ege Arg	1724
Val Ui	atg Met	act Thr	tct Ser 345	cca Pro	aat Asn	ggt Gly	gaa Glu	gag Glu 350	atc Ile	cca Pro	gtc Val	gag Glu	acc Thr 355	gat Asp	gac Asp	1772
atc Lle	gac Asp	cac His 360	ttt Phe	ggt Gly	aac Asn	cgt Arg	cgt Arg 365	ctg Leu	cgt Arg	acc Thr	gtt Val	ggc Gly 370	gaa Glu	ctg Leu	atc Ile	1820
Cag (An				cgt Arg												1868
				acc Thr												1916
				cct Pro 410												1964
														Gly	ttg Leu	2012
act Thr	tac Tyr	aag Lys 440	cgt Arg	cgt Arg	ctg Leu	tcg Ser	gct Ala 445	ctg Leu	ggc Gly	ccg Pro	ggt Gly	ggt Gly 450	Lev	tcc Ser	cgt Arg	2060
							Arg					Ser			ggc	2108
															atc	215

470					475					480					485	
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acc Thr	cca Pro	tac Tyr	cgt Arg 505	cgc Arg	atc Ile	atc Ile	gac Asp	ggc Gly 510	aag Lys	ctg Leu	acc Thr	gac Asp	cag Gln 515	att Ile	gac Asp	2252
tac Tyr	ctt Leu	acc Thr 520	gct Ala	gat Asp	gag Glu	gaa Glu	gac Asp 525	cgc Arg	ttc Phe	gtt Val	gtt Val	gcg Ala 530	cag Gln	gca Ala	aac Asn	2300
acg Thr	cac His 535	tac Tyr	gac Asp	gaa Glu	gag Glu	ggc Gly 540	aac Asn	atc Ile	acc Thr	gat Asp	gag Glu 545	acc Thr	gtc Val	act Thr	gtt Val	2348
cgt Arg 550	ctg Leu	aag Lys	gac Asp	ggc Gly	gac Asp 555	atc Ile	gcc Ala	atg Met	gtt Val	ggc Gly 560	cgc Arg	aac Asn	gcg Ala	gtt Val	gat Asp 565	2396
Ör Ö	atg Met	gac Asp	gtt Val	tcc Ser 570	cct Pro	cgt Arg	cag Gln	atg Met	gtt Val 575	tct Ser	gtt Val	ggt Gly	acc Thr	gcg Ala 580	atg Met	2444
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Mac	atg Met	cag Gln 600	aag Lys	cag Gln	gct Ala	gtg Val	cca Pro 605	ctg Leu	att Ile	cgt Arg	gcc Ala	gag Glu 610	gct Ala	cct Pro	ttc Phe	2540
otg Val	ggc Gly 615	acc Thr	ggt Gly	atg Met	gag Glu	cag Gln 620	cgc Arg	gca Ala	gca Ala	tac Tyr	gac Asp 625	gcc Ala	ggc Gly	gac Asp	ctg Leu	2588
27t.t.	att Ile	acc Thr	cca Pro	gtc Val	gca Ala 635	ggt Gly	gtg Val	gtg Val	gaa Glu	aac Asn 640	Val	tca Ser	gct Ala	gac Asp	ttc Phe 645	2636
atc Ile	acc Thr	atc Ile	atg Met	gct Ala 650	gat Asp	gac Asp	ggc Gly	aag Lys	cgc Arg 655	gaa Glu	acc	tac Tyr	ctg Leu	Ctg Leu 660	cgt Arg	2684
aag Lys	ttc Phe	cag Gln	cgc Arg 665	acc Thr	aac Asn	cag Gln	ggc Gly	acc Thr 670	Ser	tac Tyr	aac Asn	cag Gln	aag Lys 675	Pro	ttg Leu	2732
gtt Val	aac Asn	ttg Leu 680	Gly	gag Glu	cgc Arg	gtt Val	gaa Glu 685	Ala	ggc	cag Gln	gtt Val	att . Ile 690	: Ala	gat Asp	ggt Gly	2780
cca Pro	ggt Gly 695	Thr	ttc Phe	aat Asn	ggt Gly	gaa Glu 700	atg Met	Ser	ctt Leu	ggc	cgt Arg 705	, Asr	ctt Leu	cto Lev	g gtt 1 Val	2828
gcg Ala 710	Phe	atg Met	cct Pro	tgg Trp	gaa Glu 715	Gly	cac His	Asr	tac Tyr	gag Glu 720	ı Asp	geç Ala	ato Ile	e ato	ctc Leu 725	2876

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gag Glu	cac His	gag Glu	atc Ile 745	gat Asp	gcc Ala	cgc Arg	gac Asp	act Thr 750	aag Lys	ctt Leu	ggc Gly	gcc Ala	gaa Glu 755	gaa Glu	atc Ile	2972
acc Thr	cgc Arg	gac Asp 760	atc Ile	cct Pro	aat Asn	gtg Val	tct Ser 765	gaa Glu	gaa Glu	gtc Val	ctc Leu	aag Lys 770	gac Asp	ctc Leu	gac Asp	3020
gac Asp	cgc Arg 775	ggt Gly	att Ile	gtc Val	cgc Arg	atc Ile 780	ggt Gly	gct Ala	gat Asp	gtt Val	cgt Arg 785	gac Asp	ggc Gly	gac Asp	atc Ile	3068
ctg Leu 790	gtc Val	ggt Gly	aag Lys	gtc Val	acc Thr 795	cct Pro	aag Lys	ggc Gly	gag Glu	acc Thr 800	gag Glu	ctc Leu	acc Thr	ccg Pro	gaa Glu 805	3116
Glu	cgc Arg	ttg Leu	ctg Leu	cgc Arg 810	gca Ala	atc Ile	ttc Phe	ggt Gly	gag Glu 815	aag Lys	gcc Ala	cgc Arg	gaa Glu	gtt Val 820	cgc Arg	3164
gāt Asp	acc Thr	tcc Ser	atg Met 825	aag Lys	gtg Val	cct Pro	cac His	ggt Gly 830	gag Glu	acc Thr	ggc Gly	aag Lys	gtc Val 835	atc Ile	ggc Gly	3212
Val	cgt Arg	cac His 840	ttc Phe	tcc Ser	cgc Arg	gag Glu	gac Asp 845	gac Asp	gac Asp	gat Asp	ctg Leu	gct Ala 850	cct Pro	ggc Gly	gtc Val	3260
Asn	gag Glu 855	atg Met	atc Ile	cgt Arg	atc Ile	tac Tyr 860	gtt Val	gct Ala	cag Gln	aag Lys	cgt Arg 865	aag Lys	atc Ile	cag Gln	gac Asp	3308
61 y 670	gat Asp	aag Lys	ctc Leu	gct Ala	ggc Gly 875	cgc Arg	cac His	ggt Gly	aac Asn	aag Lys 880	Gly	gtt Val	gtc Val	ggt Gly	aaa Lys 885	3356
att Ile	ttg Leu	cct Pro	cag Gln	gaa Glu 890	gat Asp	atg Met	cca Pro	ttc Phe	ctt Leu 895	cca Pro	gac Asp	ggc Gly	act	Pro 900	Val	3404
gac Asp	atc Ile	atc Ile	ttg Leu 905	aac Asn	acc Thr	cac	ggt Gly	gtt Val 910	Pro	egt Arg	cgt Arg	atg Met	aac Asr 915	Ile	ggt Gly	3452
cag Gln	gtt Val	ctt Leu 920	Glu	acc Thr	cac	ctt Leu	ggc Gly 925	Trp	ctg Leu	gca Ala	tct Ser	gct Ala 930	. Gly	tgg Trp	tcc Ser	3500
gtg Val	gat Asp 935	Pro	gaa Glu	gat Asp	cct	gag Glu 940	Asn	gct Ala	gag Glu	Cto	gto Val 945	. Lys	act Thi	cto Lev	cct Pro	3548
gca Ala 950	Asp	ctc Leu	ctc Leu	gag Glu	gtt Val 955	Pro	gct Ala	ggt	tcc Ser	Leu 960	Thr	gca Ala	act Thi	cet Pro	gtg Val 965	3596
															tca Ser	3644

				970				91	75				980		
cgt Arg	cca Pro	Asn A	ege ( Arg :	gac Asp	ggc Gly	gac Asp	gtc at Val Me 9:	ig gt et Va 90	t aa al As	ac go sn Al	eg ga La As	t ggt p Gly 995	/ Lys	gca Ala	3692
			Asp				ggt Gly 1005						ccg Pro		3737
							ctg Leu 1020	Lys							3782
			His				act Thr 1035	Gly	cct Pro				att Ile		3827
			Leu				gca Ala 1050	Gln							3872
Gly O		atg Met 1060	Ğlü				atg Met 1065					gct Ala 1070			3917
aca Thr	ctt Leu	cag Gln 1075	gag Glu	ctg Leu	ctg Leu	acc Thr	atc Ile 1080	Lys	tct Ser	gat Asp	gac Asp	gtg Val 1085	gtt Val	ggc Gly	3962
			Йаl				att Ile 1095	Val				aac Asn 1100		ccg Pro	4007
							ttc Phe 1110							ctc Leu	4052
cag			Cys				gag Glu 1125	Val						act Thr	4097
			Leu				gac Asp 1140	Asp					Ala	ggc Gly	4142
			Ğĺy				tcc Ser 1155	Arg				tcc Ser 1160	Āsp	gcc Ala	4187
	acc Thr		_	caga	tca	gaaa	acaac	c gc	taga	aatc	aag	ccata	ca		4236
tcc	cccg	gac a	ttga	agag	a tg	ttct	gggg	ggaa	aggg	ag t	ttta	cgtgc	tcg	acgtaaa	4296
cgt	cttc	gat g	agct	ccgc	a to	ggcc	tggc	cacc	gccg	ac g	acat	ccgcc	gtt	ggtccaa	4356
ggg	tgag	gtc a	agaa	gccg	ıg ag	acca	tcaa	ctac	cgaa	cc c	tcaa	gcctg	aga	aggacgg	4416

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₹210> 6 \$211> 1165

212> PRT

U

\$400> 6

**愛**由 Leu Glu Gly Pro Ile Leu Ala Val Ser Arg Gln Thr Lys Ser Val 引 10 15 町

Val Asp Ile Pro Gly Ala Pro Gln Arg Tyr Ser Phe Ala Lys Val Ser 20 25 30

Ala Pro Ile Glu Val Pro Gly Leu Leu Asp Leu Gln Leu Asp Ser Tyr 35 40 45

Ser Trp Leu Ile Gly Thr Pro Glu Trp Arg Ala Arg Gln Lys Glu Glu 50 55 60

Phe Gly Glu Gly Ala Arg Val Thr Ser Gly Leu Glu Asn Ile Leu Glu 65  $\phantom{000}70\phantom{000}75\phantom{000}$  80

Glu Leu Ser Pro Ile Gln Asp Tyr Ser Gly Asn Met Ser Leu Ser Leu 85 90 95

Ser Glu Pro Arg Phe Glu Asp Val Lys Asn Thr Ile Asp Glu Ala Lys 100 105 110

Glu Lys Asp Ile Asn Tyr Ala Ala Pro Leu Tyr Val Thr Ala Glu Phe 115

Val Asn Asn Thr Thr Gly Glu Ile Lys Ser Gln Thr Val Phe Ile Gly 130

Asp Phe Pro Met Met Thr Asp Lys Gly Thr Phe Ile Ile Asn Gly Thr 145

Glu Arg Val Val Val Ser Gln Leu Val Arg Ser Pro Gly Val Tyr Phe 165

Asp Gln Thr Ile Asp Lys Ser Thr Glu Arg Pro Leu His Ala Val Lys 180 \$180\$

Val Ile Pro Ser Arg Gly Ala Trp Leu Glu Phe Asp Val Asp Lys Arg  $195 \hspace{1.5cm} 200 \hspace{1.5cm} 205 \hspace{1.5cm}$ 

Phe Gly Phe Ser Glu Ile Met Met Ser Thr Leu Glu Ser Asp Gly Val □ 245 250 255

Ala Asn Thr Asp Glu Ala Leu Leu Glu Ile Tyr Arg Lys Gln Arg Pro 260 265 270

GLy Glu Gln Pro Thr Arg Asp Leu Ala Gln Ser Leu Leu Asp Asn Ser 275 280 285

Phe Phe Arg Ala Lys Arg Tyr Asp Leu Ala Arg Val Gly Arg Tyr Lys 290 295 300

Ile Asn Arg Lys Leu Gly Leu Gly Gly Asp His Asp Gly Leu Met Thr 305 310 315 320

Leu Thr Glu Glu Asp Ile Ala Thr Thr Ile Glu Tyr Leu Val Arg Leu 325 330 335

His Ala Gly Glu Arg Val Met Thr Ser Pro Asn Gly Glu Glu Ile Pro  $340 \hspace{1.5cm} 345 \hspace{1.5cm} 350 \hspace{1.5cm}$ 

Val Glu Thr Asp Asp Ile Asp His Phe Gly Asn Arg Arg Leu Arg Thr 355 360 365

Val Gly Glu Leu Ile Gln Asn Gln Val Arg Val Gly Leu Ser Arg Met 370 375 380

Glu Arg Val Val Arg Glu Arg Met Thr Thr Gln Asp Ala Glu Ser Ile 385  $\phantom{\bigg|}$  390  $\phantom{\bigg|}$  395  $\phantom{\bigg|}$  400

Thr Pro Thr Ser Leu Ile Asn Val Arg Pro Val Ser Ala Ala Ile Arg 405 410 415

Glu Phe Phe Gly Thr Ser Gln Leu Ser Gln Phe Met Asp Gln Asn Asn 425 \$420\$

₩ Fro Ser His Tyr Gly Arg Met Cys Pro Ile Glu Thr Pro Glu Gly Pro ₩ 475 480

Asn Tie Gly Leu Tie Gly Ser Leu Ala Ser Tyr Ala Arg Val Asn Pro 495 495 496

#he Gly Phe Ile Glu Thr Pro Tyr Arg Arg Ile Ile Asp Gly Lys Leu 다 500 505 하

nj

Thr Asp Gln Ile Asp Tyr Leu Thr Ala Asp Glu Glu Asp Arg Phe Val

Val Ala Gln Ala Asn Thr His Tyr Asp Glu Glu Gly Asn Ile Thr Asp 530 540

Arg Asn Ala Val Asp Tyr Met Asp Val Ser Pro Arg Gln Met Val Ser 565  $\phantom{0}$  570  $\phantom{0}$  575

Val Gly Thr Ala Met Ile Pro Phe Leu Glu His Asp Asp Ala Asn Arg  $580 \hspace{1.5cm} 585 \hspace{1.5cm} 590$ 

Ala Leu Met Gly Ala Asn Met Gln Lys Gln Ala Val Pro Leu Ile Arg  $595 \hspace{1.5cm} 600 \hspace{1.5cm} 605$ 

Ala Glu Ala Pro Phe Val Gly Thr Gly Met Glu Gln Arg Ala Ala Tyr

610 615 620

Asp Ala Gly Asp Leu Val Ile Thr Pro Val Ala Gly Val Val Glu Ash 625 630 630 635

Val Ser Ala Asp Phe Ile Thr Ile Met Ala Asp Asp Gly Lys Arg Glu  $_{655}$ 

Thr Tyr Leu Leu Arg Lys Phe Gln Arg Thr Asn Gln Gly Thr Ser Tyr 660 665 670

Asn Gln Lys Pro Leu Val Asn Leu Gly Glu Arg Val Glu Ala Gly Gln 675 680 685

Val Ile Ala Asp Gly Pro Gly Thr Phe Asn Gly Glu Met Ser Leu Gly  $690 \hspace{1cm} 695 \hspace{1cm} 700 \hspace{1cm}$ 

Arg Asn Leu Leu Val Ala Phe Met Pro Trp Glu Gly His Asn Tyr Glu

Rep Ala Ile Ile Leu Asn Gln Asn Ile Val Glu Gln Asp Ile Leu Thr 1 725 730 735

Ser Ile His Ile Glu Glu His Glu Ile Asp Ala Arg Asp Thr Lys Leu ; 740 745 750

Gly Ala Glu Glu Ile Thr Arg Asp Ile Pro Asn Val Ser Glu Glu Val 진 755 760 765 대

beu Lys Asp Leu Asp Asp Arg Gly Ile Val Arg Ile Gly Ala Asp Val 770 775 780

Arg Asp Gly Asp Ile Leu Val Gly Lys Val Thr Pro Lys Gly Glu Thr 785  $\phantom{\bigg|}$  790  $\phantom{\bigg|}$  790  $\phantom{\bigg|}$  795  $\phantom{\bigg|}$ 

Glu Leu Thr Pro Glu Glu Arg Leu Leu Arg Ala Ile Phe Gly Glu Lys 805 810 815

Gly Lys Val Ile Gly Val Arg His Phe Ser Arg Glu Asp Asp Asp Asp 835 840

Arg Lys Ile Gln Asp Gly Asp Lys Leu Ala Gly Arg His Gly Asn Lys 865 870 875 880

Gly Val Val Gly Lys Ile Leu Pro Gln Glu Asp Met Pro Phe Leu Pro 885 890 895

Asp Gly Thr Pro Val Asp Ile Ile Leu Asn Thr His Gly Val Pro Arg 900 905 910

Arg Met Asn Ile Gly Gln Val Leu Glu Thr His Leu Gly Trp Leu Ala 915 920 925

Ser Ala Gly Trp Ser Val Asp Pro Glu Asp Pro Glu Asn Ala Glu Leu 930 935 940

Val Lys Thr Leu Pro Ala Asp Leu Leu Glu Val Pro Ala Gly Ser Leu 945 950 955 960

Thr Ala Thr Pro Val Phe Asp Gly Ala Ser Asn Glu Glu Leu Ala Gly 970 975

The Leu Ala Asn Ser Arg Pro Asn Arg Asp Gly Asp Val Met Val Asn Ser 980 985 990

Aha Asp Gly Lys Ala Thr Leu Ile Asp Gly Arg Ser Gly Glu Pro Tyr 1000 1005 1005 1005 1005

FTO Tyr Pro Val Ser Ile Gly Tyr Met Tyr Met Leu Lys Leu His U 1010 1015 1020

機站 Leu Val Asp Glu Lys Ile His Ala Arg Ser Thr Gly Pro Tyr 1025 1030 1035

Gly Gln Arg Phe Gly Glu Met Glu Val Trp Ala Met Gln Ala Tyr 1055 1060 1065

Gly Ala Ala Tyr Thr Leu Gln Glu Leu Leu Thr Ile Lys Ser Asp 1070 1075 1080

Asp Val Val Gly Arg Val Lys Val Tyr Glu Ala Ile Val Lys Gly 1085 1090 1095

Glu Asn Ile Pro Asp Pro Gly Ile Pro Glu Ser Phe Lys Val Leu 1100 \$1100\$

Leu Lys Glu Leu Gln Ser Leu Cys Leu Asn Val Glu Val Leu Ser 1115 1120 1125	
Ala Asp Gly Thr Pro Met Glu Leu Ala Gly Asp Asp Asp Asp Phe 1130 1135 1140	
Asp Gln Ala Gly Ala Ser Leu Gly Ile Asn Leu Ser Arg Asp Glu 1145 1150 1155	
Arg Ser Asp Ala Asp Thr Ala 1160 1165	
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≥221> CDS	
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2400> 7	
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tccgaaataa ggatggttc atg cca act att cag cag ctg gtc cgt aag ggc Met Pro Thr Ile Gln Gln Leu Val Arg Lys Gly l 5 10	532
cgc cac gat aag toc gcc aag gtg gct acc gcg gca ctg aag ggt toc Arg His Asp Lys Ser Ala Lys Val Ala Thr Ala Ala Leu Lys Gly Ser 15 20 25	580
cct cag cgt cgt ggc gta tgc acc cgt gtg tac acc acc acc cct aag Pro Gln Arg Arg Gly Val Cys Thr Arg Val Tyr Thr Thr Thr Pro Lys	628

		30					35					40				
aag Lys	cct Pro 45	aac Asn	tct Ser	gct Ala	ctt Leu	cgt Arg 50	aag Lys	gtc Val	gct Ala	cgt Arg	gtg Val 55	cgc Arg	ctt Leu	acc Thr	tcc Ser	676
			gtt Val													724
			atg Met													772
			tac Tyr 95													820
			aag Lys													868
	aaa Lys 125		gcg Ala	taa	atca	gca (	gete	ctaa	ge gt	cca	gtag	t to	agga	ccct		920
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ticca	accgo	cag	agcg	catc	gt c1	acg	gtgca	a ct	egaga	atct	gcc	gtga	gaa	gacc	ggcacc	1040
gato	cagt	tag	gaac	cctc	ga ga	aaggo	etete	gg(	caac	gtgc	gtc	caga	cct	cgaa	gttcgt	1100
tece	gcc	gtg	ttgg	tggc	gc ta	accta	acca	g gt	gcca	gtgg	atg	ttcg	ccc	agag	cgcgca	1160
aaca	accci	tcg	cact	gegt	g gt	tggt	taaco	e tt	cacco	cgtc	agc	gtcg	tga	gaac	accatg	1220
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ccc	ggta	ata	aata	agtg	aa t	acc	gtaa	сса	acaa	gttg	ggg	tacc	act	gtgg	cacaag	1700
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gta	agac	cac	gacc	a												1775

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<211> 127

<212> PRT

## <213> Corynebacterium glutamicum

<400> 8

Met Pro Thr Ile Gln Gln Leu Val Arg Lys Gly Arg His Asp Lys Ser 1  $\phantom{\bigg|}$  10  $\phantom{\bigg|}$  15

Ala Lys Val Ala Thr Ala Ala Leu Lys Gly Ser Pro Gln Arg Arg Gly  $20 \hspace{1cm} 25 \hspace{1cm} 30 \hspace{1cm}$ 

Val Cys Thr Arg Val Tyr Thr Thr Thr Pro Lys Lys Pro Asn Ser Ala 35 40 45

Leu Arg Lys Val Ala Arg Val Arg Leu Thr Ser Gly Ile Glu Val Ser 50 60

Ala Tyr Ile Pro Gly Glu Gly His Asn Leu Gln Glu His Ser Met Val \$5 70 75 80

Eeu Val Arg Gly Gly Arg Val Lys Asp Leu Pro Gly Val Arg Tyr Lys 0 90 V

De Val Arg Gly Ala Leu Asp Thr Gln Gly Val Lys Asp Arg Lys Gln

👜 a Arg Ser Pro Leu Arg Arg Glu Glu Gly Ile Ile Lys Asn Ala n 115 120 125 U